Topographic and Historic Factors in Geographic Urban Structure

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1 In American Cities

E.W. Burgess presented the famous concentric zone hypothesis of urban society of American cities in 1925[1]. In theory, the social zones are reflected upon urban land as an areal circular structure excluding both topographic and historic conditions which operate as distortional factors in the formation of concentric circular zones.

Topographic and historic effects can be recognized in the difference in actual areal structure among cities and also in other characteristic features. Therefore those conditions are very important in geographic analysis. Nevertheless, they have both been ignored in generalizing areal urban structures. Thus, the Burgess' concentric zone theory has been accepted as the first geographic rule of an areal urban structure.

Indeed, topographic effects seem to be less important in cities throughout the world, except in cases of original locations. Though the locational factors have direct relationships on the establishment and subsequent development of each city, they operate in a semicircular manner in the development of cities on rivers, coasts and mountain-side. This is clear from the fact that Burgess' full circular structure was deduced from the study of the lake-side city of Chicago.

Moreover, upper-class residential areas being situated on the higher elevations rather than in the downtown areas and lower-class sites on the lower or sometimes damp plots near downtown can commonly be attributed to topographic factors. These facts surely reflect the topographic conditions of urban areas, but they are only varieties of secondary importance, for they do not bring about any change in the areal relationship between the commerical and the residential area within the urban region.

H. Hoyt presented the sector theory of urban structure of American cities in 1939[2]. It has been adopted in the description of urban structures of many cities.

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1) R.E. Park, E.W. Burgess & R.D. McKenzie: *The City*, 1925, pp. 47~62

2) H. Hoyt: The Structure of American Cities in the Post-War Era, *Am. Journ. Soci.*, 48 (1942), pp. 210~218

In the author's opinion[3], however, it is of secondary importance in the generalization of urban structures, because of the numerous varieties of individual ciries.

Generally, historical elements are adhered to the land; therefore they have no mobility. If they are valuable, they will be preserved and if they are not, they will disappear with the lapse of time.

Railway lines and heavy industries which were excluded as distortional conditions by Burgess, differ from the general historic elements and are relatively new. But, they are so firmly fixed on the land that they cannot be easily removed in the face of urban expansion. Therefore, they are excellent geographical elements that constitute the distinctive features of urban structures of cities.

However, the low mobility of railway lines and heavy industries seems to act as distortional factors in American cities. While, even large buildings in American urban centers have been easily rebuilt (Photo. 1), there seems to be little difference in the mobility between large concrete buildings and small wooden houses. The resisting powers of both against the metabolism of urban areas are weaker than those of railway lines and heavy industries. Therefore, railway lines and heavy industries had to be excluded as historic factors from the consideration of urban structure by Burgess.

Almost all American cities have grown in modern times and, therefore, have few historical elements except the two cited by Burgess. Urban renewal has always been accomplished at any place within cities with the exception of the zone of transition, where metabolism is stagnant and deterioration gradually progresses.

These facts mentioned above are the characteristics in the areal structure of American cities.

2 In European Cities

Most European cities have their origin in medieval ages and some even in ancient times. Their long histories are reflected in various stages of urban growth which are shown as the three historical circular zones that were pointed out by R.E. Dickinson in 1947.[4]

Historic factors are the most important considerations in the formation of circular zones in European cities. They can not be ignored as in the case of American cities. Most buildings in European cities are constructed of brick or stone; therefore, have very low mobility and are thus different from those in

3) K. Tanabe: The Structure of Great Cities – Formation of Areal Differentiation and Development (in Japanese), *Lectures of Settlement Geography* (Shuraku-chirigaku-koza) 2 (1957), pp. 228–257

4) R.E. Dickinson: *City Region and Regionalism*, 1947, pp. 109–110

American cities. Although the interiors have been modernized, their exteriors remain unchanged from the past throughout Europe.

Tall buildings may be constructed in the central part of a city as projects of urban renewal (Photo. 2), but they are generally looked on indisfaver by the populus. Accordingly, skyscrapers are not as close together as in American cities and are isolated within the CBD. However, urban renewal is becoming so necessary with the progress of urban growth that construction of new towns or new civic centers is being projected, such as new towns in the Greater London area, and new satellite centers: Croydon in London, la Défense in Paris and EUR in Rome. New towns are situated considerably apart from there mother towns and new civic centers are located at the margins of cities (Photo. 3).

While Dickinson described the topographic conditions in each city,[5] he set them aside in his generalization of urban structures. That is to say, topographic factors have only secondary importance in the deduction of a common rule of areal structure in European cities.

3 In Japanese Cities

Most Japanese cities originated in the feudal era and a few in either older or later age. The areal structure of feudal cities and their change since the Meiji Restoration is the overlapping of two concentric circular structures that was presented by the author in 1959.[6] In the generalization of the structures, topographic factors were neglected.

The first structure took into consideration the strategic site of the feudal age, and its center was not commerical but the castle area. New circular structures have been formed since the Restoration around the commercial area, which had been only an attached functional ones in castle towns. Thus, the center was transfered from the castle site to the commerical area. Other historical elements belonging to the first structure did not disturb the formation of the second circular structure and at present they remain as scattered historical remnants (Photo. 4). It may be said that the first structure is merely historical and is now evident by the distribution of historical elements, and the second structure is active in present Japanese cities.

The history of Japanese cities, which is shorter than that of European cities and longer than that of American urban areas, is not reflected in urban structure as much as in Europe. Therefore, historic factors may disregarded for the investigation

5) R.E. Dickinson: *The West European City — A Geographic Interpretation*, 1951

6) K. Tanabe: Development of Areal Structure of Japanese cities in the Case of Castle Towns — As a geographic contribution to the study of urban structure, *Sci. Repts., Tohoku Univ.*, 7th Ser. (Geogr.), 8 (1959), pp. 88～105

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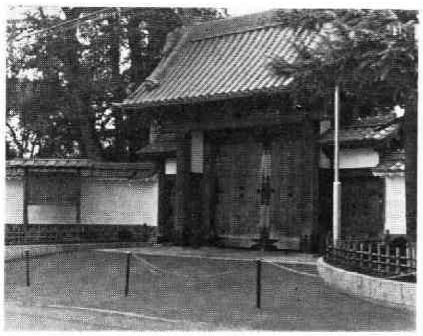

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Photo 1 Urban renewal in Chicago (1967).
New tall buildings and lot under construction. Old buildings (out of picture on left side) are reflected on the glazed wall of the new building.
Photo 2 Isolated tall buildings in London (1967).
Photo 3 Distant view of skyscrapers at la Défense from Arc de Triomphe, Paris (1974).
Photo 4 An old gate at a feudal upper-class retainer's residence in Sendai (1972).
The gate has been preserved by the city but the old house has been remodeled.
Photo 5 Urban renewal in Singapore (1967).

(Photographed by the author)

of the general structure among present-day Japanese cities as in the case of American cities.

The above mentioned transference from the first circular structure to the second means that most urban elements have greater mobility in Japanese cities as in American cities. The reasons for this are as follows: first, Japanese cities consist chiefly of wooden houses; second, at the time of the transference, urban population and built-up areas decreased; and third, urban growth has not been vertical but horizontal in order to minimize the dangers of earthquakes.

The great mobility and the horizontal expansion make possible the alternating processes of intrusion and succession between circular zones. These processes are in themselves urban renewal. Thus urban renewal has been successively and naturally occurring in Japanese cities since the Meiji Restoration.

4 In Southeast Asian Cities

In 1967, the author presented a thesis regarding circular structures with overlapped zones of commercial and residential areas for Southeast Asian cities which were developing on the bases of colonial towns.[7] The type of areal structure resembles those of European cities. In the generalization of urban structures, he neglected topographic factors, but could not exclude historic ones. However, the historical effects on urban structure are quite minor at present and they will gradually disappear from urban renewal now in progress (Photo. 5), because of the strong former colonial influences which they wish to eliminate, and also because homes have a great mobility rate.

T.G. McGee presented a model of urban structure as Hoyt's sector theory in 1967.[8] In this structure the urban center is the harbor area, which is the gate way to the colony, the center of colonial policy and the origin of the colonial town. He did not exclude historical factors, but adhered closely to the locations of cities and to the topography of the river, marsh and the coast. Consequently, McGee's generalization of semicircular structure is of secondary significance.

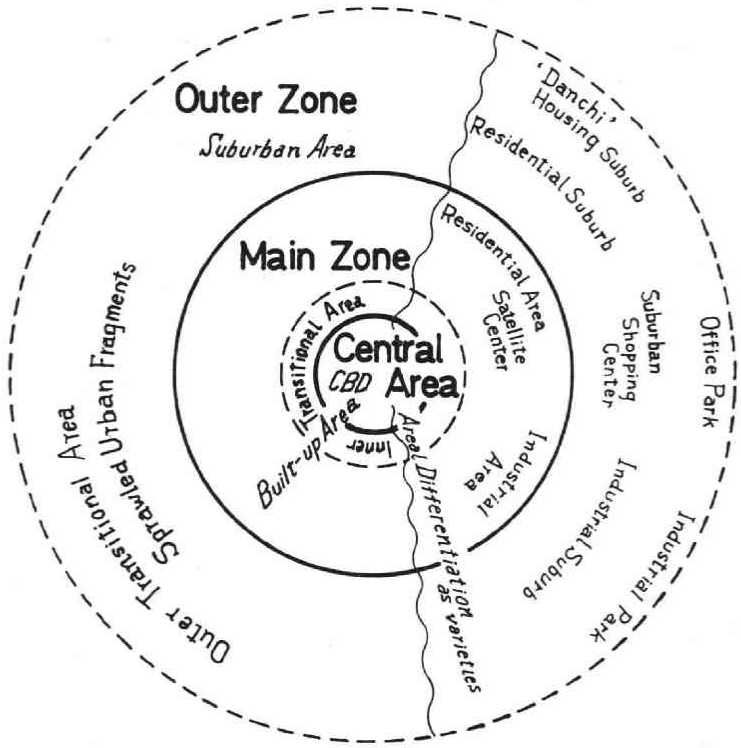
5 Conclusion

The author will generalize and simplify the most basic areal urban structure as composing the central area and the two surrounding zones as shown in the following sketch.

1) The Central Area: This region is the so-called CBD, in which many

7) K. Tanabe: The Characteristics of Areal Structure of Southeast Asian Cities (in Japanese & English Resume), *Ann. Tohoku Geogr. Ass.* (Tohoku-chiri) 19-4 (1967), pp. 157~161.

8) T.G. McGee: *The Southeast Asian City*, 1967, pp. 126~154.



New schematic circular structure of urban area

functional areas are assembled as in a mosaic.

2) The Main Zone: This zone surrounds the central area and constitutes the main part of the city. The central area and the main zone are the built-up areas of the city. The main zone is generally the residential area, which has some satellite centers as in the case of large cities. In certain topographic conditions a part of this zone is converted to an industrial area.

The inner part of this zone is the inner transitional area that is intruded by the elements of the CBD along with city growth.

3) The Outer Zone: This zone is the so-called suburban area, and, in other words, it is the outer transitional area between the urban and the rural region. In this zone many urban elements are distributed densely or loosely according to the distance from the built-up area. A residential suburb or an industrial suburb as a variety can be established in view of topographic conditions in the inner part, and a "Danchi" (housing area), an office park and an industrial park can be found in the outer part according to their locational conditions.

In this generalization both topographic and historic factors must be neglected, because both seem to be modifying factors of the zones in this basic structure.

The variations due to historic factors correspond to Dickinson's structure of European cities and the McGee's structure of Southeast Asian cities. Burgess' structure of American cities and the author's structures of Japanese and Southeast Asian cities are in the same category. Other variations may be found in cities in the Arabian world or in China.

Topographic factors, local historic factors, etc. are for the most part of lower rank and they cause only some internal varieties among zones. Moreover, their effects constitute some of the essential geographic characteristics of a city.